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NATIVE SPANISH SPEAKERS' REACTIONS TO ERRORS MADE BY ANGLOPHONES LEARNING SPANISH

BY

© VICTORIA ANN MYER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

IN

ROMANCE LINGUISTICS

DEPARTMENT OF ROMANCE LANGUAGES

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FALL 1986

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Supervisor

Date: August 14, 1986

ABSTRACT

The present study investigates the reactions of Spanish speakers to errors that are commonly made by Anglophones learning Spanish to determine which types of errors are perceived as most serious by native speakers. In Task 1, native Spanish speakers listened to pairs of sentences in Spanish which compared five types of errors commonly made by Anglophones. Each of the sentences contained an error and the subjects were asked to indicate which of the two sentences sounded worse to them. Subjects indicated that article deletions and errors in subject-verb agreement are considered the least serious, gender agreement and subjunctive errors more serious, and preposition errors considered the most serious.

In Task 2, the subjects listened to each sentence separately and indicated whether they heard an error. They were to note any sentences that they did not understand. The results for this task were similar to the first in that article deletions were detected least often and gender disagreement and subjunctive errors more often. Preposition errors are the only error type to be ranked differently in Task 2. They were ranked in the

middle between the two subtypes of subject-verb agreement when a grammatical judgement was elicited.

The subjects' responses are explained by a theory based on Beckmann's (1972) proposal that languages are error detecting codes. Language elements that carry little semantic value and which have not established a predictability value based on the preceding sentence structure will attract less attention when they contain errors. Therefore, errors in language elements with greater semantic value and higher predictability value are rated as more serious by the subjects.

Pedogogical applications for the results of the study are discussed in the final section.

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TABLE OF CONTENTS

CHAPTER		PAGE
1.	INTRODUCTION.	1
	1.1 The Problem	1
	1.2 Review of Relevant Literature.	3
	1.3 Purpose of the Study	7
	1.4 Theoretical Background	8
2.	DESCRIPTION OF THE EXPERIMENT	13
	2.1 Description of the Subjects	13
	2.2 Control of Sociolinguistic Factors	14
	2.3 Error Selection.	17
	2.4 Task 1	19
	2.5 Task 2	24
3.	DISCUSSION OF THE RESULTS	26
	3.1 Statistical Background	26
	3.2 Results for Error Types and Subtypes	27
	3.2.1 Article Deletion	27
	3.2.2 Subject-Verb Agreement	32
	3.2.3 Gender Agreement	36
	3.2.4 Subjunctive Omission	38
	3.2.5 Prepositions	39
	3.2.6 Summary	42
	3.3 Perceived Errors	44
	3.4 Control Sentences	47
	3.5 Comprehensibility Factor	49
	3.6 Comparisons with Other Studies	51

3.6.1 Spanish 52
3.6.2 French 53
3.6.3 German 55
4. CONCLUSIONS 57
4.1 Summary of Experiment. 57
4.2 Pedagogical Implications 59
4.3 Further Research 62
WORKS CONSULTED 65
APPENDIX A. SENTENCES USED FOR ERROR TYPES. 68
APPENDIX B. SUBJECT ANSWER SHEET 74
APPENDIX C. POSTTEST QUESTIONS. 77
APPENDIX D. COMPARISONS OF ERROR TYPES AND SUBTYPES .78
APPENDIX E. COMPARISONS OF PERCEIVED ERRORS 80

LIST OF TABLES

Table	Description	Page
1.	Design Comparison of Error Types	23
2.	Ordered Means of Error Types	28
3.	Comparisons of Error Types Using Tukey Test	28
4.	Ordered Means of Error Subtypes	29
5.	Comparisons of Error Subtypes Using Tukey Test	29
6.	Ordered Means of Perceived Errors	46
7.	Comparisons of Perceived Errors Using Tukey Test	46
8.	Results of Control Sentences	48

1. INTRODUCTION

1.1 The Problem

Various attempts have been made to elicit native speakers' reactions to errors made by foreigners in their native tongue. These types of studies have grown from the realization that an effective way to approach the issue of errors in the language learning situation is to consider how these errors affect the native listeners.

Language teachers inevitably encounter many types of errors in the classroom situation, all of which cannot be adequately addressed every time they arise. With the focus of language learning moving away from the traditional grammar oriented approach to more emphasis on learning to communicate, the question arises as to which types of errors are important enough to warrant a disruption in the learner's language attempts for the teacher to offer a correction. There is also the consideration of how much time and space should be dedicated to the various grammar areas in the language curricula.

The view emerging from a number of recent Error Analyses studies is that if in most cases the goal of language learning is to communicate with native speakers

of that language, then it would be advisable to consider how various types of errors affect the native speakers. Those errors that are perceived as most serious or most irritating by the native speakers will most likely disrupt the communication process. Through studies of native speakers' responses to errors in their language, language curricula can be designed to focus on the correct usage of the grammar elements that are perceived as most important by the native speaker and less time dedicated to those areas that are not disruptive.

Two different measures have been used by researchers to elicit the reaction of native speakers to errors. The first type requests responses on whether various types of errors hinder comprehension. Errors that hinder comprehension are obviously the most crucial to the communication process and studies have been conducted in various languages to determine which errors are most likely to be incomprehensible (Olsson 1972, Guntermann 1978, Johansson 1978, Chastain 1980, Galloway 1980, Piazza 1980, Riches 1984). There still exist many errors that do not render an utterance incomprehensible but can influence the communication attempt by eliciting a negative reaction from the listener. Intuitively, one is aware of this phenomenon when listening to a foreigner speaking one's own language. Although some errors are easily overlooked, there are others that attract more attention and sometimes seem serious or irritating enough

to warrant a disruption in the conversation for a correction.

This "reaction" of native speakers to errors in their own language has been the second measure, investigated under such terms as irritation (Piazza 1980), acceptability (Chastain 1980), and preference (Politzer 1978, Delisle 1982). These subjective responses have been elicited on various language categories which have included pronunciation, vocabulary, spelling, word order, and grammar (Johansson 1978, Politzer 1978, Delisle 1982, Ensz 1982). Although useful information has been gained by comparing such broad categories, the data available can be expanded and defined more precisely if these categories are broken down into more specific language elements.

The following studies in Spanish, French and German have attempted to investigate several more specific grammar elements, although the elements used vary according to the investigation. The results from these studies can be used to develop hierarchies of seriousness of error within the languages studied and by comparing results across languages, universal trends in native speakers' responses may emerge.

1.2 Review of Relevant Literature

Two studies of native speakers' responses have been conducted in Spanish. Guntermann (1978) included a final

phase in her error analysis of Spanish in which she compared article omissions and errors in article agreement, and compared errors of tense, *ser/estar*, and person in verbs using a forced-paired comparison design. The only conclusive results obtained were that article agreement errors were found to be much less acceptable than article omissions. The study was only preliminary and was designed to test procedural factors. It was to be followed by more thorough investigations which have not yet been published.

Chastain (1980) conducted a study to elicit responses from native speakers on written sentences containing errors in Spanish. The sentences chosen for the investigation were derived from a list of errors considered most serious by teachers of intermediate Spanish. Chastain asked his subjects to locate and rate each error as either comprehensible and acceptable, comprehensible but unacceptable or incomprehensible. He found that most sentences could be understood even outside of the context of discourse. Those that were misunderstood were word errors: wrong, extra, or omitted words. The most unacceptable errors included verb forms, whereas the acceptable errors were elements such as definite article deletions, noun-adjective agreement and the use of an imperfect verb for a preterite.

In a study of French Piazza (1980) asked subjects to

rate sentences with embedded grammatical errors on either a comprehension or an irritation percentage scale (0% 25% 50% 75% 100%). The subjects were divided into four groups. One group of subjects responded to errors in oral French on a comprehension scale, another group to written French on the comprehension scale, another responded to spoken French on an irritation scale, and another to written French on the irritation scale. As expected by the investigator, generally the less comprehensible an erroneous utterance the more irritating it was. Of the six types of errors used, least tolerance was shown for errors in irregular verb forms or confusion of auxiliaries in passé composé and confusion of pronouns. The greatest tolerance was for errors of tense usage and gender or subject-verb agreement.

Politzer (1978) conducted a study with a forced-paired comparison design using spoken German sentences. His intent was to compare the perceived seriousness of error of phonology, case endings, verb morphology, gender confusion, word order and vocabulary. Delisle (1982) replicated Politzer's study of German, presenting the stimuli in written rather than oral form. Both researchers found that age and education play a role in evaluations, and that vocabulary and verb morphology errors were considered more serious by the older respondents and case ending problems and phonology or spelling errors the least serious. These studies made no

attempt to distinguish irritation and comprehension, which makes it difficult to judge on what basis the subjects responded.

From the three languages studied, it appears that errors in verb forms are considered more serious by native respondents and agreement errors such as gender are considered less serious. Guntermann (1978) and Chastain (1980) both found that article deletions were also perceived as less serious.

Although various procedures were employed in the above studies to elicit a subjective response from the subjects, the results of all the studies indicate that there are varying degrees of perceived seriousness of grammatical errors according to native speakers and that there are general similarities in subjects' responses, despite language background or experimental design. The results also confirm that the study of the reactions of native speakers can indicate to what degree errors may influence the flow of communication between native speakers and learners of their language.

The investigators of all of the preceding studies have discussed their results only in terms of the grammar of that particular language. The next step is to consider the reasons behind the responses of the native speakers. If the subjects' choices are considered, there appears to be a basis for the native speakers' perceptions in view of the fact that certain trends seem

to be common to many of the subjects. The study of the patterns of native speakers' reactions to errors in their native tongue may give us some insight into how errors affect the individual's processing of incoming information.

1.3 Purpose of the Study

To expand the knowledge available from Chastain's (1980) study of Spanish speakers' reactions to written errors in Spanish, the present investigation is designed to study the effect of spoken errors made by Anglophones learning Spanish. A forced-paired comparison design similar to Politzer's (1978) is used to compare five error types in Spanish. The results from this study are compared to Chastain's to determine whether there is a difference in the perceptions of native listeners depending on whether the mode of input is spoken or written. Comparisons are also made with the studies in other languages mentioned above to determine if there are similar trends in the reactions of native speakers of various language backgrounds to the types of errors studied in this experiment.

Although the previous researchers have discussed their results in the context of the grammar of the language they studied and have given suggestions as to pedagogical applications, no one has attempted to explain the reasons for the native speakers' reactions.

This study categorizes the results of the perceptions of native Spanish speakers to errors made by English speakers in terms of the grammatical context of Spanish and applies these results in a pedagogical context. To consider further the responses of the native speakers from a psycholinguistic viewpoint, an interpretation of the results is offered in terms of a theoretical framework of language processing.

1.4 Theoretical Background

To speculate on the language processing of the native listener, a model of language proposed by Beckmann (1972) which views language as an error detecting code will be considered. This information processing theory proposes that when any type of information is transmitted, if only the minimal amount of information is presented the correct message can be received only if there is no "noise" nor any intervening factors that distort the message. But if "check" items that do not carry additional information, and are therefore redundant, are inserted at intervals to verify the information being transmitted, the listener has supporting data to confirm the message and combat any noise variables. If a check item does not correspond correctly with the information items, an error is detected. This system then acts to assure the receiver that the proper message is being conveyed, and if not, it offers an opportunity to clarify

ambiguities.

Beckmann proposes that natural languages operate in the same error detecting manner. Lexical information carries the message to be transmitted, but the grammatical structure of language establishes requirements that utilize "check morphemes" to facilitate the correct and clear conveyance of the basic message. Consider, for example, the sentence *The baby wants milk.* If a child who has not mastered the total coding system were to utter *Baby want milk* the sentence would be understood, even though it is syntactically ill-formed. In this case, the definite article is redundant along with the third person singular inflection of the verb, because it is understood who wants the milk even when these grammatical components are deleted. These are examples of check morphemes that reduce the likelihood of ambiguity and ensure the conveyance of the basic message presented by the information morphemes *baby, want* and *milk.*

Some morphemes in language may act as either information morphemes or check morphemes depending on the environment in which they are found. In some languages such as Spanish, a subject noun or pronoun is not required if it is understood in the context of the sentence. The person and number morpheme of the verb then acts as the information carrier, indicating the subject when the subject noun or pronoun is not

specified. On the other hand, if the subject is mentioned in the sentence the person and number morpheme is then redundant.

The use of check morphemes, to be effective, must be systematic and presented in predictable locations so that the listener knows where to expect them. The rules of a particular language establish these check morphemes by requiring that the information of the incoming signal be presented in a manner consistent with the morphological and syntactic regulations of that language. The speaker may choose whatever is to be said, but the message must be delivered within the structure of the language and use the check morphemes required by grammatical rules. The listener, who also understands the code and its requirements, has expectations about how information will be received. The compliance with or violation of these expectations confirms whether the message is being understood.

If a person processes incoming information in the linear order that it is received, there are grammatical structures that will establish certain requirements for forms that are to follow. If a first person singular subject is used the listener will expect a verb to follow that carries the first person singular inflectional morpheme. The listener may rightfully expect certain grammatical forms to appear corresponding to prior information given earlier in the sentence. The greater

the expectation established by prior information, the greater is the perceived violation of an error in that item and the more salient it is to the listener who is expecting a particular construction that is subsequently not heard. For this discussion, "predictability value" will be the term used to express the level of expectation established for a particular form, based on previous grammatical segments of the sentence.

A morpheme or lexical item can also vary in the amount of information it offers to the basic message of the sentence. For instance, in the sentences *The baby wants milk* and *The lady wants milk* the lexical items *baby* and *lady* carry a high level of basic information because it is evident that by changing the noun *baby* to *lady* the meaning of the sentence is changed substantially.

If on the other hand, the sentences *The book is on the table, The book is in the table, The book is at the table* are compared it is understood where the basic location of the book is, despite the use of three different prepositions. This difference in the amount of information a form contributes to the basic message will be termed "semantic value". Prepositions in the examples above carry some semantic value because a slightly different concept of location is portrayed by each, but there is not the same extent of confusion when they are interchanged as in the case of *baby* and *lady*.

Prepositions could, in this context, be considered as exhibiting less semantic value than nouns.

The morphemes which are used incorrectly in this experiment will be discussed in terms of their semantic value along with their predictability value. It appears that the interplay of these two factors offers some insight into the perceptions of the native speakers. The higher the level of semantic value and the greater the predictability value of the erroneous morpheme, the more likely the error will be perceived as sounding worse to the native listener.

2. DESCRIPTION OF THE EXPERIMENT

2.1 Description of Subjects

Thirty native Spanish speakers served as subjects in the present study. Thirteen of the subjects were recruited from The Latin American Students' Association at the University of Alberta and the rest were either undergraduate or graduate students of the University of Alberta or in some way affiliated with the University. The length of residence in an English speaking country ranged from less than a year to eighteen years. Twenty-one were of Chilean background, seven were from Mexico, one from Guatemala, two from El Salvador, three from Costa Rica, one from Ecuador, two from Peru, and two from Spain. There were thirteen females and seventeen males and they ranged in age from eighteen to forty years.

All subjects had completed at least their high school education. The majority were studying at the undergraduate level, and several graduate students also participated. Thus, the subjects of this experiment can be characterized as having completed secondary, or were in the process of completing post-secondary education.

Five dollars were paid either to each subject, or for

those from the Latin American Students' Association, donated to their organization.

2.2 Control of Sociolinguistic Factors

Preceding the study subjects were asked to fill out a form which requested personal data to be used for statistical analysis. It was the intent of the study to investigate language forms that would be familiar to any speaker of standard Spanish and the stimuli used in the test instrument were controlled during the selection process to conform to a standard Spanish that would be acceptable in any Spanish speaking country. Because it was assumed that subjects would respond to the errors as a homogeneous group regardless of their personal background, it was necessary to run several statistical tests to eliminate certain sociolinguistic factors that could have been influential variables in determining the choices of the subjects.

The first variable considered was the countries of origin of the subjects. Spanish is spoken in a large geographical part of the world and its use can vary considerably among countries and regions. Because of this possible variable the subjects were divided into two groups according to their countries of origin, to compare their answers. The first group included the South Americans, mostly Chileans with one person from Ecuador and two from Peru. The large Chilean community

in Edmonton contributes to the fact that a large percentage of the Latin American students at the University of Alberta are from Chile. Almost half of the subjects used in this experiment were Chilean. The second group contained the Central Americans, Mexicans and Spaniards. Because there were only two Spaniards who could not constitute a separate statistical group, they were included in this group for convenience sake. If subjects had responded differently according to their countries of origin, then the groups would have been further divided and compared, but it appeared that subjects were responding similarly.

The country of origin factor was analysed using a Hotelling Two-Sample T^2 test that compares the vectors of the different treatments, in this case, the error types or subtypes between the two subject groups. The whole test is protected at the .05 significance level which means that the significance levels used for all the comparisons made within the test total .05 rather than each separate comparison employing a .05 significance level. No significant difference was found between the groups' choices of any of the error types or subtypes.

A second consideration was the difference in the length of time the subjects had resided in an English speaking country. The range was from less than one year to eighteen years. A longer exposure to English might make Spanish speakers more familiar with the kinds of

English to Spanish transfer errors that an Anglophone might commit, which could affect the native speakers' perceptions of these types of transfer errors. Also, the length of time the subjects spent functioning in a foreign language environment where English speakers' positive responses to their communicative efforts were important could possibly affect the Spanish speakers' judgements on errors made by foreigners in Spanish.

The subjects were again divided into two groups, one containing the participants who had a length of residence of less than six years and the other group with six years and over. According to the Hotelling Two-Sample T^2 test there were no significant differences in the choices of error types and subtypes between the groups.

Finally, subjects were asked to indicate the percentage of time they presently speak Spanish. It was thought that the amount of practise the native speakers have in their own language may affect which types of errors were perceived as more serious. The Hotelling Two-Sample T^2 test which compared those subjects who speak Spanish less than 60 percent of the time and those who speak it more than 60 percent of the time showed no significant differences in the their choices of error types and subtypes.

The preceding tests indicate that the subjects responded primarily as a homogeneous group regardless of their native countries, length of residence in anEnglish

speaking country, or the amount of time they speak Spanish.

2.3 Error Selection

Since the purpose of the investigation was to measure the reaction of native Spanish speakers to common errors made by Anglophones learning Spanish, several error analyses and previous studies of errors made by Anglophones learning Spanish as a foreign language were examined (Guntermann, 1978, Azevedo 1980, Galloway 1980, Smith 1980). Five of the most common errors were selected from these studies on the assumption that the errors committed most frequently would likely be the ones most often encountered by the native listener. Most of the errors chosen were based on Azevedo (1980) which is an error analysis of advanced students of Spanish as a foreign language. It was assumed that those students who continue in foreign language study beyond the first or second year are also most likely to search out opportunities to interact with native speakers and thus are the ones to which a native speaker will most often be exposed.

After the five error types were selected, they were then each divided into two subtypes. The five error types and subtypes chosen are as follows (the correct form is indicated in parentheses):

1. Errors in preposition use

   Addition of an unnecessary preposition--*Los hijos imitan a los actos que observan en sus padres. (imitan los actos) 'Children imitate the actions that they observe in their parents.'*

   Use of an incorrect preposition--*Los niños están estudiando a la escuela durante el dia. (en la escuela) 'The children are studying at school during the day.'*

2. Indicative in place of subjunctive

   After clauses containing impersonal expressions of doubt, willing or emotion--*Es necesario que hay más gente para continuar el curso. (que haya) 'It's necessary that there are more people to continue the course.'*

   After adverbial clauses--*Preparemos la comida tan pronto como volvemos del mercado. (volvamos) 'Let's prepare the meal as soon as we return from the market.'*

3. Lack of gender agreement

   Between a noun and adjective--*Algunos creen que la violencia en la televisión es malo. (mala) 'Some think that violence on television is bad.'*

   Between a subject and participle in a passive sentence--*Muchas obras de teatro fueron presentados en este edificio. (presentadas) 'Many theater performances were presented in this building.'*

4. Lack of subject-verb agreement

Use of a plural verb with a mass noun--*Cuando hay un accidente la policía vienen a investigarlo. (viene) 'When there is an accident the police come to investigate it.'*

Use of a singular verb with a plural subject in a passive *se* construction--*En el sur del país se cultiva varios productos agrícolas. (cultivan) 'In the south of the country various agricultural products are grown.'*

5. Article deletion

Before a proper name--*Se dice que doctora Gómez es la mejor de esta ciudad. (la doctora Gómez) 'It's said that Doctor Gómez is the best in this city.'*

Before the name of a language--*Para la gente de Brasil, portugués es la lengua nativa. (el portugués) 'For the people of Brazil, Portuguese is their native language.'*

See Appendix A for a complete list of the sentences used in this study.

Hereafter the term "error types" will refer to the five main headings and "error subtypes" will refer to the ten subdivisions of the five main error types.

2.4 Task 1

In preparation for this study, several pilot studies were run using various experimental designs. Two studies

used a paired comparison design where subjects were asked to choose between two sentences. The first studied several grammatical structures in Spanish. The second was conducted in English to evaluate several logistical factors such as the time needed between the presentation of the sentences and whether similar sentences with differing errors were easier to choose between than entirely different sentences.

In the third pilot study native Spanish speakers were asked to listen to three short paragraphs in Spanish spoken by an Anglophone and to note anything they noticed that sounded strange to them. It had been suggested that the subjects' responses would be more authentic if the sentences with the errors would be presented in a context. Errors that would be noticed by the native listeners would obviously be the most salient errors.

This attempt to present the errors in a contextual design seemed to present the listener with an overload of information and made it quite difficult to establish whether the subject was responding to only those errors this investigator wished to explore. The fact that the subjects were asked to write while listening to the information added contaminating attention variables.

The design decided upon for the first task in the present study, or what shall be termed Task 1, was the forced-paired comparison design (used by Politzer 1978) in which the subjects were presented with two sentences

and asked to indicate which of the two sentences sounded worse. Although a contextual situation was sacrificed, it was assumed the subjects were more likely to react to the error embedded in the sentence rather than to other factors because there was less information to attend to at one time.

Each error type was represented by eight sentences, four containing the first error subtype and four the second subtype. As noted above, these sentences were modeled on actual errors made by Anglophones found in various error analyses and previous studies of this type. An attempt was made to use only common vocabulary of neutral content. All sentences were constructed in such a way that they were approximately the same length and all errors in a subgroup were placed in relatively the same position in the four sentences. Each sentence contained only one error.

Five control sentences were constructed containing each of the five error types. Each sentence was paired with a sentence that did not contain an error. These five pairs of sentences were designed to serve as checks to determine whether the subjects were reacting to the errors in the sentences rather than to some other factor.

After the sentences were constructed, they were presented in written form to five native Spanish speakers from three different countries who were graduate students at the University of Alberta and teachers of a

first-level Spanish class. The judges were asked to read the sentences and correct anything that seemed incorrect or strange to them in Spanish. Based on the responses to this exercise the sentences were modified to exhibit the most natural Spanish construction and contain only the errors that the investigator wished to test.

In Task 1 the sentences were paired so that every error subtype was compared with each other error subtype, except that error subtypes within a given error type were not compared with each other. It was assumed that the number of times an error subtype was chosen compared to the other error subtype within that particular error type would indicate whether subjects reacted differently to the two error subtypes. The design used compared each error type four times with every other error type resulting in forty comparisons. The five control pairs were included, which brought the number of pairs of sentences to which the subjects responded to forty-five. Table 1 illustrates the pairing of the sentences excluding the control sentences. The capital letters represent the error types and the numbers represent the subtypes.

Once the sentences were paired, the forty-five pairs were then recorded onto a tape in random order by the experimenter, an Anglophone who is a graduate student and instructor in Spanish. Only one speaker was used to control for any pronunciation or voice variables that

would have been presented by using various speakers. The instructions for the subjects were read by a native Costa Rican (see Appendix B for the instructions and answer sheet).

Table 1. Design Comparisons of Error Types

	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2
A1			*	*	*	*	*	*	*	*
A2			*	*	*	*	*	*	*	*
B1					*	*	*	*	*	*
B2					*	*	*	*	*	*
C1							*	*	*	*
C2							*	*	*	*
D1									*	*
D2									*	*
E1										
E2										

Because the participants heard two sentences paired together it was questioned whether there would be a bias because of memory or attention factors toward either the first or second sentence just because it was heard in first or second position. Each sentence example was used twice in the experiment. To try to control for a serial ordering effect, in one comparison a sentence example of a particular subtype was presented as the first sentence of a pair and in the other comparison in which the same sentence example appeared it was presented as the second sentence. In this manner all sentences were heard in both first and second position. After administering the experiment, to further check this possible intervening variable, a Hotelling One-Sample T^2 test was used to

determine whether there was any significant difference between the number of times an error type was chosen in first or second position. The results showed that there was no significant preference among the subjects for a sentence independent of the position in which it was presented ($p<.05$).

In Task 1, the subjects were asked to listen to each of the pairs of sentences and to indicate which of the two sentences sounded worse. They were told in the recorded instructions that the experimenter was not interested in the grammatical correctness of a given sentence but in their reaction to it. This particular instruction was meant to reassure the subjects that it was not their grammatical knowledge that was being tested, and that they need not analyse the grammatical structure of the sentences to make a decision. It was hoped that this would elicit a more spontaneous reaction from the subjects which would be more similar to that which they would experience when speaking with an Anglophone learning their language.

2.5 Task 2

In the second task, the same subjects were requested to listen to each of the fifty sentences, which had been recorded separately, and indicate if there was an error in each sentence or to mark the sentence NC--*No comprendo 'I don't understand'* if it was not

comprehensible. This was to check if errors were being perceived and to make a comparison between whether the sentences in which errors were more often perceived would also be the sentences that were chosen more often in Task 1. Since errors that are comprehensible are being studied in this investigation the request to indicate incomprehensibility was meant to confirm this.

The tape containing the two experimental tasks lasted eighteen minutes, after which a short posttest interview was conducted to gather any information on details that might help clarify the decisions and perceptions of the participants. See Appendix C for the questions used. The study was conducted in groups ranging in size from one person to six people and the posttest interviews used the same numbers.

3. DISCUSSION OF RESULTS

3.1 Statistical Background

After the tests were administered to the subjects and the data tabulated, a one-way analysis of variance (ANOVA) was conducted which compared the means of the number of times the five error types were chosen to determine if there were significant differences between them. Another one-way ANOVA was used to compare the error subtypes. Both ANOVAs showed significant differences among the means ($p<.01$).

Post hoc tests were then employed to determine where the significant differences were located. The Tukey HSD (honestly significant difference) multiple comparison method was used in this case. Tukey's method is based on the sampling distribution of 'q', the studentized range which is defined as the range of the set of observations divided by an estimate of the standard deviation of the values whose range is being covered. Based on this statistic the experimental error is held constant for all contrasts being made (Myers 1979, 294).

Table 2 lists the error types, in descending order, according to the mean number of times they were chosen. The reader should remember that "choice" of a sentence by

subjects reflects their judgement that it sounded "worse" than the sentence it was paired with. Errors in the prepositions were chosen the most often, followed by subjunctive, gender agreement, subject-verb agreement and finally article deletion. Table 3 indicates which error types, when compared to each other, were chosen a significantly different number of times using the Tukey test. Tables 4 and 5 give the same information after breaking the five error types into ten subtypes. See Appendix C for a complete breakdown of means and comparisons.

3.2 Results for Error Types and Subtypes

3.2.1. Article Deletion

Sentences containing deletions of an article were chosen significantly less often than gender, preposition and subjunctive errors. They were therefore considered as a less serious error. Considering the two subtypes, it was found that the deletion of an article before a titled name was chosen significantly less than both preposition subtypes, both subjunctive subtypes and gender disagreement between a subject and a participle. An article deletion before the name of a language was chosen significantly less than both of the preposition errors and less than a replacement of indicative for subjunctive after an impersonal phrase in the independent

Table 2. Ordered Means of Error Types

Error Types	Means
A. Prepositions	9.867
B. Subjunctive	9.567
C. Gender agreement	8.467
D. Subject-verb agreement	5.800
E. Article deletion	5.667

Table 3. Comparisons of Error Types Using Tukey Test

	A	B	C	D	E
A				*	*
B				*	*
C				*	*
D					
E					

* = significant difference between the number of times error types were chosen ($p<.05$).

Table 4. Ordered Means of Error Subtypes

Error Subtypes	Means
A1. Prepositions--unnecessary	5.367
B1. Subjuncitve--impersonal expressions	5.300
A2. Prepositions--substitution	4.500
C2. Gender agreement--subject/participle	4.400
B2. Subjunctive--adverbial clauses	4.267
C1. Gender agreement--noun/adjective	4.067
D1. Subject-verb agreement--mass nouns	3.800
E2. Article deletion--languages	2.933
E1. Article deletion--titled proper names	2.733
D2. Subject-verb agreement--passive *se* construction	2.000

Table 5. Comparisons of Error Subtypes Using Tukey Test

	A1	B1	A2	C2	B2	C1	D1	E2	E1	D2
A1							*	*	*	*
B1							*	*	*	*
A2								*	*	*
C2									*	*
B2									*	*
C1										*
D1										*
E2										
E1										
D2										

* = significant difference between the number of times error subtypes were chosen ($p<.05$).

clause.

The two article deletion subtypes are not significantly different from one another, but they are not functioning identically in view of the fact that article deletion before proper names shows significant differences with more subtypes that are ranked above it. Although there may be a small difference between the subjects' reactions to the two error subtypes, they fall in relatively the same range at the lower end of the scale and will be considered together as article deletions.

When the materials for this experiment were being prepared, Spanish-speaking judges were asked to correct the sentences to be used in this study. Even when the sentences were presented on paper some judges missed the article deletions. This supports the low level of attention focused on article deletion errors.

Also, during the pilot study mentioned earlier, one subject commented that she did not hear an error in one of the sentences. When the investigator asked her if she remembered which sentence it was, she referred to a sentence that contained an article deletion in the experiment and she repeated the sentence including the article originally deleted. In this particular case it appears that the subject had unconsciously added the article where it was needed without perceiving its deletion. On the other hand, during the posttest

interviews several participants commented on missing articles when asked what types of errors bothered them the most, even though the results showed that they tended to choose this error less often than other types of errors.

According to the information processing theory as presented by Beckmann (1972), articles are considered redundant features of grammar containing little semantic value and serve only as check morphemes. Although it may be questioned whether semantic value is not expressed by the choice of an indefinite or definite article, Beckmann (1972, 165) argues that some languages, such as Russian, do not have this distinction. Even in English, the article is deleted when it is seen as unnecessary, as in newspaper headlines such as MAN KILLED IN CAR CRASH NEAR CITY LIMITS. Both definite and indefinite articles are deleted in *a man, a car crash, the city limits* and the message is clearly understood.

Although there may be a few cases where the difference between a definite or indefinite article may actually change the meaning, for the large part they carry little semantic meaning that is not conveyed elsewhere in the string. As a result, it would follow that while processing the language input, articles may not be very important to the listener.

Also, in the case of article deletion, the nouns carrying the semantic information to which the articles

refer, such as the name of the person or the language, come after the deletion of the article. Therefore if the listener, at the moment of input, is processing the information in linear order as it is heard, a prior expectation indicating an upcoming definite article has not been established by preceding grammatical or semantic information. This would indicate little violation of the listener's expectations because prior incoming information has not established a predictability level for the article.

A low level of both semantic and predictability value place article deletions at the bottom of the hierarchy, as being the least serious type of error in the perceptions of the native speakers.

3.2.2 Subject-Verb Agreement

Considered as one error type, an error in subject-verb agreement is chosen, along with article deletion, significantly less often than gender agreement, subjunctive, and preposition errors. But the two subgroups of subject-verb agreement receive different reactions from the native speakers. The failure to make a verb plural in a passive *se* construction is chosen less often than making a verb plural after a mass noun such as *la gente* or *la policía*.

This difference may be explained in terms of the listener's expectations based on the physical position of

the words containing the errors in the sentence, and expectations based on a changing spoken Spanish language.

The reflexive verb construction in the third person is used frequently in Spanish in place of the true passive construction and may be structured in two ways. In the first, a subject is expressed with which the verb, preceded by its object *se* must agree in number, as in *Se venden legumbres en ese mercado 'Vegetables are sold at that market'*. The verb is plural because the subject *legumbres* is plural. *Legumbres* is the grammatical subject of a reflexive verb although logically it appears as the object of the verb because the vegetables are not actually selling themselves. It is understood that someone who is not identified is selling the vegetables.

In the second case, *Se dice que 'It is said that'* a grammatical subject is not expressed and the verb is always in the third person singular along with the same reflexive pronoun *se*. An impersonal subject is understood.

This distinction, where in the first case the verb must agree in number with the subject and in the second the verb is always singular, is a grammatical explanation of standard Spanish. Some native speakers do not perceive *legumbres* in the first case as the logical subject but as the object and thus do not make the verb plural. This confusion is supported by the second form in which an impersonal subject is expressed using a singular

verb form without an expressed grammatical subject. In both cases, semantically it is known that someone is carrying out the action of the verb without stating who that person is. Therefore, in spoken Spanish both forms may take the singular verb with the pronoun *se* (personal communication, Professor Algeo).

This confusion has led to the development of an acceptable form that expresses what was once the grammatical subject of a passive *se* construction as an object when talking about people; *Se mató a su padre* *'His father was killed'* instead of *Se mató su padre* *'His father killed himself'*. The *a* indicates that *su padre* is now the grammatical direct object of the verb and the second construction takes on a purely reflexive meaning. The plural construction *Se mataron sus padres* would indicate again only a truly reflexive or reciprocal meaning; *'His parents killed themselves'* or *'His parents killed each other'*.

This variance in use, even among native speakers, could explain the fact that the failure to make a verb agree with the grammatical subject in passive *se* constructions is not perceived as a serious error, since it may be used or heard by native speakers themselves.

In the case of the second subject-verb agreement subtype, a plural verb would never be heard from a native speaker directly following a mass noun nor in the same clause. An error of this type would then be likely to be

more salient to the native listener.

Article deletion and subject-verb agreement seem to be set apart at the bottom of the hierarchy. As discussed earlier, articles are redundant features carrying little semantic value. In the case of subject-verb agreement there is also redundancy in that the subjects of the sentences are clearly defined and the verb inflectional morphemes indicating number and person are used as check morphemes to confirm the subjects of the sentence.

In terms of predictability value based on the expectations established by the order of presentation of the string, the mass nouns such as *la policía* or *la gente* would predispose the listener to expect a singular verb to follow. In this case, different from both the article deletion and the passive *se* constructions, the error comes after an expectation is created by a preceding structure. The error in the verb after a mass noun is therefore considered as more serious by the subjects. In the passive *se* construction the subject follows the verb and in article deletion the noun follows the deletion. In all instances the nouns are the information carriers and therefore establish the meaning that is to be conveyed and the verb inflectional morphemes and articles are check items.

3.2.3 Gender Agreement

An error in gender concordance is chosen significantly more often than article deletion or subject-verb disagreement. Even when divided into the subtypes of noun-adjective disagreement and subject-participle disagreement in passive sentences there appears to be little difference in native speakers' choices. Considering only the means, errors in gender agreement ranked in the middle.

Beckmann (1972, 175) considers the rules of gender concord to be redundant based on the evidence that there are languages that operate successfully without employing gender rules. Although gender morphemes do not carry semantic meaning in most cases in Spanish, there are instances when speaking about male and female people or animals that the gender morpheme denotes actual sex distinctions. The question could be raised as to whether these occurrences of actual sex differences might not influence the importance of the concept of gender in the perception of the native speaker although grammatically they often contain no semantic value.

Another factor that may place more importance on the gender morphemes is that unlike articles, the adjectives that use the gender check morphemes can be placed farther away in the sentence from the noun to which they refer. Therefore, the grammatical check function that the gender morpheme fulfils may be of more importance for an easy

understanding of which adjective is attached to which noun.

The fact that gender is generally not sex based in Spanish makes it necessary for even the native speaker to learn the gender category of new nouns. This requirement would call more attention to this particular category than the use of articles which are not formally learned but acquired as a native speaker acquires the language. This conscious focus of native speakers on gender assignment may draw attention to errors in this area.

In the examples of gender agreement used in this study, the nouns to which the adjectives referred came first and established a context in which the adjectives that followed would be expected to agree in gender with the nouns. This idea of the importance of expectation may be further sustained by the fact that sentences with errors in gender agreement were most often marked as incomprehensible in Task 2 of the study. The confusion in meaning could stem from the fact that the adjectives in the sentences used were separated from the noun they modified by several words. The adjectives did not agree with the nouns because of the gender error and could possibly create confusion as to which noun they were referring.

Errors in gender agreement rank above article deletion and subject-verb agreement because of a higher level of semantic value founded on a sex-based concept of

gender and a higher level of predictability value established by a preceding noun in the sentence, along with greater attention focused on the formal learning of gender categories by native speakers.

3.2.4 Subjunctive

The failure to employ a verb in the subjunctive mood is chosen significantly more often than article deletion and subject-verb disagreement. Indicative in place of subjunctive mood after an adverbial clause is viewed as a more serious error than an article deletion with proper names or subject-verb disagreement in passive *se* constructions. Indicative mood rather than subjunctive after impersonal clauses is also judged more severely than both types of article deletions and both types of subject-verb agreement errors. Although this difference is not major it could be argued that the substitution of indicative for subjunctive after an impersonal clause is heard as more serious to the native listener than indicative after an adverbial clause.

It could be suggested that the subjunctive morpheme is redundant, considering that the sentence can be understood using the indicative form and that some languages, such as English, function virtually without any subjunctive. On the other hand, in some cases a choice exists between indicative and subjunctive to convey different meanings in the sentence, thereby

offering support for its semantic function.

For instance, in the question *¿Crees que ella viene mañana? 'Do you think she'll come tomorrow.'* the speaker is asking for an affirmation from the listener about something that s/he thinks will probably happen. Whereas, by using the subjunctive, *¿Crees que venga mañana?* the speaker displays doubt about whether she will come or not. There is a difference in meaning which is shown by the choice of the subjunctive or indicative mood.

According to standard Spanish, the independent clauses used in this experiment require a subjunctive form to follow in the dependent clauses, again establishing an expectation for the listener or creating a high level of predictability value for the subjunctive form. The high level of predictability along with the inherent characteristic of semantic value in the subjunctive morpheme constitute a greater degree of violation with its omission.

3.2.5 Prepositions

Errors in prepositions are viewed by the subjects as most serious based on the mean number of times chosen over other types of errors. They are chosen significantly more often than article deletions and cases of lack of subject-verb agreement. Considering the results for the subtypes, the use of the wrong

preposition was chosen significantly more often than both types of article deletion and subject-verb disagreement in passive *se* constructions. Unnecessary prepositions ranked at the top, and were chosen significantly more often than both types of article deletion and subject-verb disagreements.

That preposition errors rank highest on the list may not be surprising in that they carry more semantic value than the other errors in the study, and therefore play a greater role in conveying information important to the basic message of the sentence in which they are found.

If prepositions are considered in terms of predictability value, the situation may be more complex than the other error types because of the higher level of semantic value. There is no expectation for an upcoming preposition established by preceding grammatical information but the preposition itself may be the first element that sets up an expectation for a noun phrase to follow that would be congruent with the preposition in that particular context. When a noun phrase follows that is not compatible with the preposition, then the grammatical expectation established by the preposition would be seriously violated. For instance, in one of the examples of preposition substitution errors *Se ofrece muy buena comida al nuevo restaurante español. 'Very good food is offered at the new Spanish restaurant'* the preposition should be *en* rather than *a* (*a* and the

article *el* are contracted to *al*). But if a noun that indicates a person is substituted for the noun phrase *el nuevo restaurante*, it would be correct, *Se ofrece muy buena comida a los clientes 'Very good food is offered to the customers'*. The prepositions used in this study establish an expectation for the listener which is then violated by an inappropriate noun phrase which follows. Therefore the listener does not perceive the error until s/he hears the noun phrase. Does the listener then have to backtrack to confirm the message? This would require more energy from the listener and draw attention to the error.

If it were possible it would be of interest to measure the processing time needed for sentences with preposition errors as compared to, for example, sentences with article deletions to determine whether the listener takes more time to go over one type of sentence as compared to another to clarify the meaning.

Since the noun in the prepositional phrase carries more semantic value than the preposition in terms of the whole sentence it becomes apparent that the error occurs with the preposition rather than the noun. Subjects knew it should be *en el nuevo restaurante* rather than something such as *a los clientes*. This does not negate the possibility that in the first hearing a certain expectation is set up by the preposition and then modified when an incongruent noun phrase follows. The

attention needed to reassess the structure of the prepositional phrase would pose more difficulty for the processing of the listener and cause the error to sound worse or stand out more.

This explanation would apply to both unnecessary prepositions and wrong prepositions but the unnecessary prepositions appear to be slightly more serious according to the responses of the subjects. It could be speculated that the expectation is violated even more when a phrase follows that does not even require a preposition rather than one that requires a different preposition. This was confirmed by the fact that many subjects commented on this error in the posttest interview. Though they often could not reproduce the extra preposition, they remembered the sentence which contained it as being bothersome.

3.2.6 Summary

According to this study, preposition, subjunctive, and gender errors sound worse to native Spanish speakers than article deletions and errors in subject-verb agreement. The failure to make a verb agree in a passive *se* construction is considered less serious than making a verb plural when it refers to a mass noun.

Considering the data from the various errors with respect to an error detecting code theory it is proposed that the more redundant a feature, or the less semantic

value it carries, the less irritating an error in that component will be to the native listener. In conjunction with semantic value, the greater the extent to which an expectation in the grammatical formation is violated or the higher the predictability value of the morpheme containing the error, the more noticeable the error is to the native listener because of the role of prediction in the process of language comprehension.

Support for these notions can be seen in the fact that article deletions and the failure to make the verb agree with the subject in passive *se* constructions deal with redundant features that carry little semantic value. These erroneous morphemes are also of low predictability value because the grammar contexts in which they are found create less expectation for their appearance. The lexical item that carries the semantic meaning to which these morphemes refer appears after the article deletion or the singular verb and calls less attention to the error.

On the other hand, adjectives involving gender agreement and subjunctive verb forms have greater semantic value. The sentences containing these grammar elements and verbs following mass nouns involve phrases or words that establish a prior expectation of the forms that should follow which generate a higher level of predictability. The violation of these expectations is then more serious than article deletions or incorrect

passive *se* constructions.

Prepositions, ranking at the top, are more complex. First there is a complete word involved rather than an inflectional morpheme on a correct stem and the preposition carries a higher degree of semantic value. The preposition itself may set up an expectation about the features of the following noun phrase. If these expectations are violated, the error is reflected back onto the preposition because the following noun phrase carries an information item of more semantic value than the preposition. If such a marked process does occur it would account for the native listeners' more serious reactions to prepositions.

In conclusion, the more semantic value a morpheme carries, and the more predictability value it contains because a grammatical expectation has been established by the preceding structure of the sentence, then the higher is the degree of perceived violation that occurs when there is an error in that morpheme.

3.3 Perceived Errors

In Task 2 during the second part of the investigation, subjects were presented with the individual sentences used in Task 1 and asked to indicate whether they contained errors. It was assumed that if errors were not perceived, then they would be less distracting to the native listener. A one-way ANOVA was

run comparing the mean number of times an error was detected (there were four examples of each error subtype). The results showed a significant difference among the error subtypes ($p<.01$). A post hoc Tukey HSD test was then run to determine where those differences were ($p<.05$).

The results of this particular section of the study (see Tables 6 and 7) were comparable to those from Task 1 except for the prepositions. Article deletions and incongruence of subject and verb in passive *se* constructions were detected least often. Indicative for subjunctive and lack of gender agreement were perceived most often, but misuse or unnecessary use of prepositions ranked in between subject-verb agreement errors in mass noun constructions and subject-verb agreement errors in passive *se* constructions.

It appears that when the subjects were asked to concentrate on the grammatical correctness of the sentence, preposition errors did not stand out in the same way as when the subjects were asked only to indicate what sounded worse to them. This is an interesting finding considering that a preposition error was chosen the most often in Task 1. This result might be a function of what items are stressed when native speakers are taught grammar. Structures such as prepositions and articles may not have been part of the curriculum, and therefore errors in those areas may not be as easily

TABLE 6. Ordered Means of Perceived Errors

Error Subtype	Means
C2. Gender agreement--subject/particple	3.667
B1. Subjunctive--impersonal expressions	3.667
C1. Gender agreement--noun/adjective	3.567
B2. Subjunctive--adverbial clauses	3.267
D1. Subject-verb agreement--mass nouns	3.000
A1. Prepositions--unnecessary	2.733
A2. Prepositions--substitution	2.500
E1. Article deletion--proper names	2.233
D2. Subject-verb agreement--passive *se*	2.167
E2. Article deletion--names of languages	2.000

Table 7. Comparisons of Percieved Errors Using Tukey Test

	C2	B1	C1	B2	D1	A1	A2	E1	D2	E2
C2							*	*	*	*
B1							*	*	*	*
C1							*	*	*	*
B2									*	*
D1										*
A1										*
A2										*
E1										
D2										
E2										

* = significant difference between the number of times error subtypes were chosen ($p<.05$).

identified because there is no prior focus of attention on those forms. Errors may be attributed to register differences rather than a violation of grammar requirements. This might explain why the subjects reacted differently to preposition errors when they were asked to indicate their perception of sentences according to how they sounded rather than make a grammatical judgement about the sentences. Since no other studies have considered the errors in preposition use there is nothing with which to compare these results.

Except for preposition errors, Task 2 would seem to support the view that these subjects are consistent in their responses, whether the method used to measure speakers' perceptions places emphasis on a spontaneous reaction to the sound of the sentence or on a judgement of the grammatical correctness of the sentence. Errors in prepositions are perceived as more serious only when a personal reaction is elicited from the subjects rather than when they are asked to give a grammatical evaluation of the error.

3.4 Control Sentences

Five pairs of sentences were used as controls to confirm that subjects were actually responding to the errors in the sentences and not to other possible factors. One sentence in each of the pairs contained an error from one of the error types and the other sentence

was of a similar construction but did not contain an error.

The control sentences were also included in Task 2 in which subjects were asked to indicate whether the sentences contained errors. Table 8 shows, in the first column, the percentage of subjects in Task 1 who chose the sentence in the control pairs that contained an error. The second column shows the percentage of subjects in Task 2 who indicated an error in the control sentences containing an error, and in the third column, the percentage of subjects indicating an error in the error-free control sentences are shown (See Appendix A for examples of the sentences used).

TABLE 8. Results of the Control Sentences

Errors:	TASK 1 Choice of sentence with error	TASK 2 Indication of error in sentence	TASK 2 Indication of error in error-free sentence
Prepositions	97%	100%	0%
Subjunctive	87%	93%	20%
Gender	97%	97%	6%
Subject-verb	67%	57%	6%
Article	73%	70%	13%

There is a correlation (.98) between the percentages for the choices of the sentence with an error in the control pairs in Task 1 (column 1) and the percentage of indications of an error in the erroneous control sentence in Task 2 (column 2). When the control sentence pairs were presented in Task 1, even though one sentence

contained an error both sentences could have sounded error-free if the error tended to be of the type that was not detected as indicated in Task 2. In that case a random decision should have been made as to which sentence sounded worse. The fact that a subject might randomly choose either sentence would lower the number of times the actual error-embedded sentence was chosen, which is shown in column 1. This explains why the error types that were detected less often in Task 2 and were chosen less often in Task 1 are the error types that have a lower percentage in columns 1 and 2.

The error-free sentences used for subjunctive and article use appear to be possibly eliciting a reaction to some other part of the sentence because subjects indicated errors (column 3). There may be a problem in the construction of some of the sentences, but all sentences were confirmed as correct by the native judges used while preparing the material. Perhaps because Task 2 was the second part of the study and followed the rather intense Task 1, some discrepancies can be attributed to fatigue or waning attention.

3.5 Comprehensibility Factor

In Task 2 subjects were asked to indicate whether they heard an error in the sentences and to indicate if they did not understand a particular sentence. This task was to verify that subjects responded to sentences that

were understandable despite the error, since comprehensibility was not a factor to be studied in this experiment.

Fifteen sentences were marked once as *no comprendo*, which meant that the other 29 participants found the sentences comprehensible. One sentence was marked by two subjects and one sentence by three subjects (See Appendix A where starred sentences indicate those sentences marked as incomprehensible).

Since so few subjects agreed on the incomprehensibility of the sentences it is difficult to comment on this aspect of the study. More sentences with preposition errors and gender errors were marked as incomprehensible than sentences which contained the other three error types. This reaction to preposition errors could be explained by the same factors as mentioned previously, namely, rejection based on the greater violation of the semantic and predictability value they contain. The greater the violation the more attention needed to process the sentence which could hinder the comprehension of the message.

Gender errors are more difficult to explain. The noun in the sentence establishes the gender to be expected in the following modifying adjectives. The farther away the adjective occurs from the noun, the harder it is to locate the noun to which it refers, especially when the adjective does not agree in gender.

In this study because of the error, the noun and adjective do not agree in gender, and therefore may confuse the listeners as to the meaning of the sentence.

If incomprehensibility was a result of problematic elements in the structure of some sentences, it would have been of benefit to use a greater number and variety of native judges to comment on the comprehensibility and naturalness of the sentences to be used in this study. On the other hand, as mentioned in the discussion of the control sentences, Task 2 was the second part of the experiment and subjects could have been affected by fatigue and lack of concentration which would cause them to miss important information and render the sentences incomprehensible.

Although there are a few discrepancies, on the whole the control sentences and indications of comprehensibility seem to support the basic premise of this experiment which is that the subjects responded to the errors that were meant to be studied rather than other aspects of the sentences. The errors studied are also of the type that generally do not hinder the comprehensibility of the context in which they are found.

3.6 Comparisons with Other Studies

Various other studies have been conducted on native speakers' reactions to errors in their language but many have dealt with the comparisons of broad categories and

those that have treated more specific grammar elements have varied considerably on which elements were studied. The following discussion will include only those studies that have considered at least some of the errors types used in this investigation and only those error types investigated in this study will be compared.

3.6.1 Spanish

Chastain's (1980) study of comprehensibility and acceptance of errors in written Spanish was constructed differently than the present one, but some tentative comparisons can be made, assuming that subjects in this study would choose less "acceptable" errors as sounding worse.

In Chastain's study all types of omissions of definite articles were considered acceptable by fifty percent or more of the native judges. Comparing those errors common to this study, subjects rated as comprehensible but unacceptable, in descending order of importance:

1. The improper use of *para* and *por* (which was one type of incorrect preposition substitution used in the present study)
2. The incorrect use of subjunctive
3. No gender agreement between the noun and the adjective. However, the failure to make a demonstrative agree with the noun was considered

acceptable.

Chastain's findings of comparable error types seem to follow a similar ranking to that found in the present study. This would appear to indicate that native Spanish speakers are reacting in a similar manner to both written and spoken stimuli. Also of interest is the fact that Chastain's subjects were Spaniards from Madrid, whereas the great majority of the native Spanish speakers in this study were Latin Americans. This suggests a certain homogeneity among native Spanish speakers' reactions to these types of errors regardless of their regional backgrounds.

Guntermann (1978) found in a paired comparison study that article disagreement was considered significantly less acceptable than article deletion. This could possibly compare with the rating of article deletion below gender agreement in the present study and again point to the consistency of native Spanish speakers' reactions.

3.6.2 French

Piazza (1980, 425) studied six general types of errors in French which were ranked by subjects, from most irritating to least irritating on the following percentage scale:

irritating 0% 25% 50% 75% 100% not irritating

The means for the six general error types were

computed, and the results follow:

Noun markers	57%
Agreement	57%
Word order	56%
Tense usage	52%
Pronouns	47%
Verb forms	37%

Using these categories, the results of Piazza's study appear consistent with the present study since noun markers include article omission, agreement includes gender and subject-verb agreement and tense usage includes subjunctive errors. Prepositions were not included in Piazza's study.

Piazza then divides the six main categories into twenty subgroups and ranks them according to the means from the same percentage scale. If the specific errors that were also used in the present study are extracted from this ordered subgroup list, Piazza's results were as follows from least to most irritating (1980, 425):

Agreement--gender of adjective	57%
Tense usage--subjunctive	52%
Agreement--subject-verb ending	50%
Noun markers--omission of definite article	44%

The results of the spoken part of the investigation are in almost direct opposition to the results found in the present study in which article deletions are least serious and subjunctive and gender agreement more serious. Although it is possible that this difference may be attributed to the difference in language, this seems unlikely in view of the fact that Spanish and French are both Romance Languages and share many of the

same structural characteristics. A more likely explanation may be found in the difference in the design of the two experiments. Piazza's subjects were asked to rate their "irritation" toward the sentences on a percentage scale. This is a much more ambiguous task for the subjects than being required to choose between two sentences as was done in the present study. Also the percentage scale appears to be backwards with irritation being marked at the lower end of the scale and no irritation at the higher percentage levels. This could affect the choices of the subjects as well. By using a different method it may be that Piazza measured a different reaction than that which was measured in this investigation.

3.6.3 German

The older subjects (14-17) of Politzer (1978) and those of Delisle (1982) considered German errors in verb morphology more serious than gender confusion. This result is at variance with the present study, where gender confusion sounded worse to the subjects (who were adults) than subject-verb agreement. This difference could be attributed to the fact that Politzer and Delisle used different verb morpheme problems than did the present study. They considered problems such as errors in past participles and incorrect present tense endings. These morphemes may carry more importance in the

communication function of the language than the erroneous morphemes used in the present study. Politzer also asked for a judgement from his subjects on grammatical correctness by requesting them to choose which sentence was "worse German". As seen in the preposition problem in this study, where subjects sometimes seemed to respond differently when they concentrated on the grammatical correctness of the sentence, Politzer and Delisle's subjects may have used different criteria in making their decisions with consequent differing results.

A comparison of the results of the present study with previous investigations indicates findings similar to the earlier studies conducted in Spanish but at variance with comparable results in French and German studies. With so few studies to compare, the question still remains whether the differences found in other languages are because of a difference in experimental design or because each language generates a very specific set of expectations and reactions to errors based on the grammatical structure of that language and its requirements.

4. CONCLUSIONS

4.1 Summary of Experiment

To study the reactions of native Spanish speakers to errors made by Anglophones, five errors commonly committed in Spanish by English speakers were chosen and presented orally in sentences to native Spanish speakers. In Task 1 native speakers were asked to choose one of two sentences containing errors, according to which sounded worse to them. Each of the five error types was compared with each other. Statistical tests were run to determine which types of errors were chosen more often by native speakers, thus indicating which errors sounded worse. During Task 2 native speakers listened separately to each sentence and were asked to indicate whether they heard an error.

Native Spanish speakers indicated by their choices that article omissions and subject-verb disagreement, more in passive *se* constructions than in plural verb constructions with mass nouns, sounded the least offensive. Errors in gender agreement, subjunctive, and prepositions sounded worse to native speakers.

When subjects were asked to focus on whether they heard an error, similar results were found. Article

omissions were not identified as errors as often as, for instance, the lack of subjunctive. The errors that were not detected by the subjects would naturally not be rated as sounding as bad.

The only error type that was perceived differently in Task 2 was the preposition errors. Although judged as sounding worse in Task 1, preposition errors ranked in the middle when subjects were asked to indicate whether they heard an error. This difference was attributed to a lack of attention to prepositions in the formal grammatical education of native speakers.

Native speakers' responses can not only give indications of what sort of grammar mistakes in the native tongue are considered more serious, but they may also offer some insight into how incoming language information is processed. By studying the characteristics of the errors that subjects choose as sounding worse and comparing them to the errors that are not as salient, patterns can be recognized and possible explanations can be formulated for the reasons behind the perceptions of native speakers to errors in their language.

The investigator suggests that the listener's perceptions of errors are influenced by how much semantic value the morpheme containing the error carries and how much predictability value is established by previous grammatical structures in the sentence. The higher the

semantic and predictability value of a particular morpheme the greater the degree of violation that occurs when an error appears in that morpheme.

In the case of article deletion, no prior expectation has been set up grammatically in the sentence to indicate that an article is to appear. The article also carries almost no semantic value. These two features cause less attention to be drawn to an error in this morpheme during the processing of the incoming string.

Prepositions, on the other hand, carry more semantic value, and because of that, can establish a context for an expected appropriate noun phrase to follow. When the noun phrase is incongruent with the preposition, there is a high level of violation and more energy expended to decode the message, thus attracting the attention of the native listener.

By studying the reactions of native listeners, useful insight can be gained in terms of the grammatical context of the particular language in question, but also a more universal understanding of language processing can be developed.

4.2 Pedagogical Implications

In most cases the goal of a language learner is to be able to communicate effectively with native speakers of that language. The facility of conversation can be affected by comprehension factors, but errors that do not

impede comprehension can also be irritating to the listener and distract attention from the communication process.

Although the ultimate result of the language learning process may be error-free speech, it is a long and arduous task. Teachers and language learners must deal with many types of errors and often find it difficult to decide which sorts of problem areas should receive the most attention in the language learning process. The responses of native speakers, as to which errors are perceived as most serious, can be used to establish criteria for classroom curriculum. Emphasis can be placed on the concepts around errors that will cause irritation to the listeners. If the student can acquire correct control of the language in those areas that are most salient to the native speaker, the communication interaction will be facilitated and more positive feedback elicited which encourages the attempts of the language learner.

From the results of this study, we may conclude that if a student is to be prepared best to communicate with native speakers of Spanish it would be beneficial to emphasize the acquisition of correct preposition and subjunctive use. The experimenter's personal experience as both a language learner and teacher suggests that the problem of subjunctive use is much more widely acknowledged than that of preposition use. This may be

due to the fact that subjunctive is more than just a grammatical point taught to the students. It is a whole new language concept for Anglophones learning Spanish, since subjunctive is virtually nonexistent in English. Because a new concept is difficult to understand and acquire, there is a lot of emphasis put on subjunctive in the classroom. On the basis of this study, it appears that preposition use is of at least as much importance.

Prepositions often cannot be directly translated between languages or are used in quite different contexts in the foreign language than in the native language of the learner. This poses a problem in both the teaching and learning of preposition use and it seems that many educators assume that prepositions will be acquired without much concentrated practise. According to these results, this is an area that needs to be stressed more than it is presently, and possibly more than other traditional grammar problems.

Article deletions and subject-verb agreement in passive *se* constructions and with mass nouns seem to be of less importance to the native listener, and therefore there is less necessity to stress or correct errors in this area in the communicative efforts of the language learner of Spanish.

Gender agreement ranks in the middle of the hierarchy of errors in this study. It is also a new concept for the Anglophone learning Spanish, but in contrast to the

subjunctive, its grammatical use is obligatory because every noun and its modifiers require gender agreement. Once that requirement is understood by the learner, it is a matter of practise and attention to forms that constitute its correct use.

A limited number of error types have been dealt with here. As was observed in the case of subject-verb agreement subtypes, even fairly specific error types can play a variable role according to the form and context. More extensive research is required to establish a more comprehensive organization of grammar errors according to native speaker reaction. The present study is a step in that direction.

4.3 Further Research

Although various studies have been conducted using native speakers as judges of errors in their native language, almost all have used different experimental designs and different measures of the reactions of the subjects. Sentences containing errors have been rated as "which sounds worse" (present study), "worse German" (Politzer 1978 and Delisle 1980), "unacceptable or acceptable" (Chastain 1980), or "irritation" (Piazza 1980). It is evident that subjects could be reacting to various factors depending on how their reaction is elicited. Studies replicating or expanding ones which have been done previously would make more accurate

comparisons possible.

Secondly, the error types studied range from broad categories such as phonology or grammar to more specific errors in verb morphology. This makes comparisons within the various languages and between languages quite difficult. To discover relevant patterns, it is necessary to replicate studies using comparable categories so that more conclusive results can be formulated about general trends of native listeners' perceptions.

These types of studies could also be expanded to treat more comprehensive coverage of language problems and include more types of languages. Language learning situations can then be tailored to deal most effectively with problems that will be irritating or noticeable to the native speaker with whom the language learner will come in contact.

In the psycholinguistic realm, more extensive studies could be conducted on the language processing explanations proposed here which are based on Beckmann's error detecting code theory. Studies which employ controlled examples of varying degrees of semantic and predictability value could be studied to test more stringently the hypothesis that the greater the semantic and predictability value a morpheme contains the more attention is attracted by errors in that morpheme.

Native speakers' reactions to errors in their

language can contribute to a greater understanding of how the communicative efforts of a language learner will be received in the target language context along with offering insights into the language process of the listener.

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APPENDIX A. SENTENCES USED FOR ERROR TYPES

PREPOSITIONS

A1 Unnecessary

Ana alcanza a un nivel más alto que los otros del grupo.
(alcanza un nivel)
'Ana reaches a higher level than the others in the group.'

A los niños les toca para hacer la cama a los seis años.*
(les toca hacer)
'It's up to the children to make their bed when they're six years old.'

Es importante para cambiar pronto el aceite en este carro. (importante cambiar)
'It's important to change soon the oil in this car.'

Los hijos imitan a los actos que observan en sus padres.
(imitan los actos)
'Children imitate the actions that they observe in their parents.

A2 Substitution

Los niños están estudiando a la escuela durante el día.
(en la escuela)
'The children are studying at school during the day.'

Entre buenos amigos hay una gran necesidad para la honestidad.* (por la honestidad)
'Between good friends there is a great necessity for honesty.'

Para ser buen maestro se requiere entusiasmo para la enseñanza.* (por la enseñanza)
'To be a good teacher enthusiasm for teaching is required.'

Se ofrece muy buena comida al nuevo restaurante español.*
(en el nuevo restaurante)
'Very good food is offered at the new Spanish restuarant.'

* Marked as no comprendo by one subject.
** Marked as no comprendo by two subjects.
*** Marked as no comprendo by three subjects.

SUBJUNCTIVE

B1 Impersonal expressions

Es imposible que ellos se quedan en casa todo el día.
(se queden)
'It's impossible that they stay in the house all day.'

Es necesario que hay más gente para continuar el curso.
(que haya)
'It's necessary that there are more people to continue the course.'

Es difícil que ella sale mucho con tres niños pequeños.
(que ella salga)
'It's difficult that she can go out much with three small chilren.'

Es preferible que el cliente viene manaña a las nueve.
(el cliente venga)
'It's preferable that the client comes tomorrow at nine o'clock.'

B2 Adverbial clauses

Lo voy a esperar hasta que regresa de la casa de Teresa.
(hasta que regrese)
'I'm going to wait for him until he returns from Theresa's house.'

Preparemos la comida tan pronto como volvemos del mercado. (volvamos)
'Let's prepare the meal as soon as we return from the market.'

Carolina puede pagar la cuenta en cuanto recibe el sueldo. (en cuanto reciba)
'Caroline can pay the bill as soon as she receives her salary.'

Jaime irá al cine con Lucía después que cena con su familia.* (que cene)
'James will go to the movies with Lucy after he eats supper with his family.'

GENDER AGREEMENT

C1 Noun/Adjective

Estela piensa que ella va a ir mañana pero no está seguro. (está segura)
'Stella thinks that she will go tomorrow but she isn't sure.'

Algunos creen que la violencia en la televisión es malo.* (es mala)
'Some think that violence on television is bad.'

El director dice que la idea es interesante y muy bueno.* (muy buena)
'The director says that the idea is interesting and very good.'

Marcos cree que la reunión es importante pero aburrido. (pero aburrida)
'Mark thinks that the meeting is important but boring.'

C2 Subject/Participle

Muchas obras de teatro fueron presentados en este edificio. (presentadas)
'Many theater performances were presented in this building.'

Las instrucciones más claras fueron ocupados en el examen.* (fueron ocupadas)
'The clearest instructions were used on the exam.'

Las últimas modas de vestir fueron discutidos en la conferencia. (fueron discutidas)
'The lastest fashions were discussed in the conference.'

Las técnicas más eficaces fueron examinados en la reunión.* (fueron examinadas)
'The most efficient techniques were examined in the meeting.'

SUBJECT-VERB AGREEMENT

D1 Mass nouns

Si hay un partido emocionante todo el mundo gritan demasiado. (grita)
'If there is an exciting game everyone screams a lot.'

Cuando hay un accidente la policía vienen a investigarlo. (viene)
'When there is an accident the police come to investigate it.'

Me sorprende que la gente lleguen tan temprano a la fiesta. (llegue)
'It surprises me that the people arrive so early at the party.'

Siempre que hay un incendio mucha gente van a verlo.* (va)
'Whenever there is a fire a lot of people go to see it.'

D2 Passive Se Constructions

En el sur del país se cultiva varios productos agrícolas. (se cultivan)
'In the south of the country various agricultural products are grown.'

En esta parte del país se pesca pocas truchas sabrosas.*** (se pescan)
'In this part of the country very few flavorful trout are caught.'

En aquel restaurante se sirve varios platos de la argentina. (se sirven)
'In that restaurant various Argentinian dishes are served.'

Para enviar un hombre a la luna se necesita billones de dólares. (se necesitan)
'To send a man to the moon billions of dollars are needed.'

ARTICLE DELETION

E1 Proper Names

Creo que señora Rodriguez vive cerca del nuevo banco.
(la señora Rodriguez)
'I think Mrs. Rodriquez lives near the new bank.'

Se dice que doctora Gómez es la mejor de esta ciudad.
(la doctora Gómez)
'It's said that Doctor Gómez is the best in this city.'

Se observa que los hijos de señora Castro son muy educados. (la señora Castro)
'It can be observed that Mrs. Castro's children are very well-mannered.'

Creo que doctor Pérez tiene su oficina en la calle dos.
(el doctor Pérez)
'I think Doctor Pérez has his office on Second Street.'

E2 Languages

Mi actitud positiva hacia español se debe a la gente latina. (hacia el español)
'My positive attitude toward Spanish owes itself to the Latin people.'

Su gran amor por francés le ayuda mucho en el Canadá.*
(por el francés)
'His great love for French helps him a lot in Canada.'

Debido al sistema de tonalidad, chino es una lengua difícil.* (el chino)
'Because of the tonal system, Chinese is a difficult language.'

Para la gente de Brasil, portugués es la lengua nativa.
(el portugués)
'For the people of Brazil, Portuguese is their native language.'

CONTROLS

A. Se pueden comprar muchas legumbres frescas a ese mercado.* (en ese mercado)
'One can buy many fresh vegetables at that market.'

Todos los domingos vamos al cine con nuestros padres.
'Every Sunday we go to the movies with our parents.'

B. No es conveniente que ellos nos visitan este fin de semana. (nos visiten)
'It's not convenient that they visit us this weekend.'

Es inútil que ella trate de convencerlo de lo contrario.*
'It's useless that she tries to convince him differently.'

C. Si otro puesto se crea Rebeca va a ser trasladado.* (trasladada)
'If another position is created, Rebecca will be transferred.'

Los candidatos serán entrevistados mañana por la tarde.
'The candidates will be interviewed tomorrow afternoon.'

D. En el oeste de la ciudad se contruye muchas casas caras.** (se construyen)
'In the west of the city many expensive houses are built.'

En un hotel de primera clase se limpian bien los cuartos.
'In a first class hotel the rooms are cleaned well.'

E. Roberto conoce a señora González porque trabajan juntos. (la señora González)
'Robert knows Mrs. González because they work together.'

Cuando la niña se enferma llaman a la doctora Calvo.
'When the girl gets sick Doctor Calvo is called.'

APPENDIX B. SUBJECT ANSWER SHEET

I. La información personal que se pide se usará sólo para análisis estadístico. Su nombre se usará sólo si es necesario, por alguna razón inesperada, ponernos en contacto con usted para obtener más información a este respecto. Muchas gracias.

Nombre_____

Edad ___18-20 ___21-25 ___26-30 ___31-40 ___41-50 ___51-60 ___más de 60.

País de procedencia_____

Nivel de educación

___Universidad ¿Qué año?_____
___Colegio ¿Qué año?_____
___Otro ¿Cuál?_____

¿Cuántos años ha estudiado formalmente inglés?_____

¿Por cuántos años ha estado en un país donde se habla inglés?_____

Según usted, usted habla inglés
_____muy bien _____bien _____más o menos _____mal
_____muy mal _____nunca

¿Qué porcentaje del tiempo habla usted español?
___0-20 ___20-40 ___40-60 ___60-80 ___80-100

¿Además del español y el inglés habla usted otro idioma? ¿Cuál?_____

II. Va a escuchar noventa frases en español organizadas de dos en dos, es decir, en cuarenta y cinco parejas. Estas frases son dichas por una persona extranjera. Muchas de las frases tienen errores. Además, es posible que escuche una frase más de una vez en diferentes ocasiones.

Escuche las dos frases de la pareja y escoja cual de las dos le suena peor a usted. No nos interesa la corrección gramatical de cada frase sino su reacción a las frases. Se escuchará cada pareja sólo una vez. Después, tendrá 5 segundos para escoger cual frase le suena peor.

En la hoja de respuestas que sigue, marque con una "X" la frase que haya escogido. Por ejemplo, si le suena peor la primera frase de la pareja, marque con una "X" la "a" y si le suena peor la segunda, marque con una "X" la "b".

HOJA DE RESPUESTAS

1.	a	18.	a	35.	a
	b		b		b
2.	a	19.	a	36.	a
	b		b		b
3.	a	20.	a	37.	a
	b		b		b
4.	a	21.	a	38.	a
	b		b		b
5.	a	22.	a	39.	a
	b		b		b
6.	a	23.	a	40.	a
	b		b		b
7.	a	24.	a	41.	a
	b		b		b
8.	a	25.	a	42.	a
	b		b		b
9.	a	26.	a	43.	a
	b		b		b
10.	a	27.	a	44.	a
	b		b		b
11.	a	28.	a	45.	a
	b		b		b
12.	a	29.	a		
	b		b		
13.	a	30.	a		
	b		b		
14.	a	31.	a		
	b		b		
15.	a	32.	a		
	b		b		
16.	a	33.	a		
	b		b		
17.	a	34.	a		
	b		b		

Ahora, va a escuchar individualmente las frases una vez más. Escuche la frase y si no oye un error deje el espacio vacío. Si hay un error ponga en el espacio una "X". Además si no comprende una frase ponga "NC" (no comprendo) en el espacio.

Vamos a empezar.

1____	21____	41____
2____	22____	42____
3____	23____	43____
4____	24____	44____
5____	25____	45____
6____	26____	46____
7____	27____	47____
8____	28____	48____
9____	29____	49____
10____	30____	50____
11____	31____	
12____	32____	
13____	33____	
14____	34____	
15____	35____	
16____	36____	
17____	37____	
18____	38____	
19____	39____	
20____	40____	

APPENDIX C. POSTTEST QUESTIONS

1. ¿Hubo bastante tiempo para tomar su decisión? 'Was there enough time to make your decision?'

2. ¿Cuál es su reacción a esta investigación? 'What is your reaction to this investigation?'

3. ¿Hubo algunas frases o tipos de frases que le molestaron más? ¿que le molestaron menos? 'Were there some phrases or types of phrases that bothered you more? that bothered you less?

4. ¿Cuál sería su reacción hacia una persona que comete errores de este tipo? 'What would be your reaction toward a person who commits errors of this type?'

5. ¿Qué le parece el acento de la persona de la cinta? 'What do you think of the accent of the person on the tape?'

6. ¿Cuál cree usted que es el propósito de esta investigación? 'What do you think is the purpose of this investigation?'

APPENDIX D. COMPARISONS OF ERROR TYPES AND SUBTYPES

Comparisons Between Levels of Error Types

Critical Value for Test Statistic = 4.71 for $p < .05$

Levels of Errors*			Means			Test Statistic
E	VS	B	5.667	-	9.567	-8.86
E	VS	A	5.667	-	9.867	-9.54
E	VS	C	5.667	-	8.467	-6.36
E	VS	D	5.667	-	5.800	-0.30
B	VS	A	9.567	-	9.867	-0.68
B	VS	C	9.567	-	8.467	2.50
B	VS	D	9.567	-	5.800	8.55
A	VS	C	9.867	-	8.467	3.18
A	VS	D	9.867	-	5.800	9.24
C	VS	D	8.467	-	5.800	6.06

*See Appendix A for Description of Error Types

Comparsions Between Levels of Error Subtypes

Critical Value of Test Statistic = 5.16 for $p < .05$

Levels of Error Subtypes			Means			Test Statistic
E1	VS	E2	2.733	-	2.933	-0.69
E1	VS	B1	2.733	-	5.300	-8.84
E1	VS	B2	2.733	-	4.267	-5.28
E1	VS	A1	2.733	-	5.367	-9.07
E1	VS	A2	2.733	-	4.500	-6.09
E1	VS	C1	2.733	-	4.067	-4.59
E1	VS	C2	2.733	-	4.400	-5.74
E1	VS	D1	2.733	-	3.800	-3.67
E1	VS	D2	2.733	-	2.000	2.53
E2	VS	B1	2.933	-	5.300	-8.15
E2	VS	B2	2.933	-	4.267	-4.59
E2	VS	A1	2.933	-	5.367	-8.38
E2	VS	A2	2.933	-	4.500	-5.40
E2	VS	C1	2.933	-	4.067	-3.90
E2	VS	C2	2.933	-	4.400	-5.05
E2	VS	D1	2.933	-	3.800	-2.99
E2	VS	D2	2.933	-	2.000	3.22
B1	VS	B2	5.300	-	4.267	3.56
B1	VS	A1	5.300	-	5.367	-0.23
B1	VS	A2	5.300	-	4.500	2.76
B1	VS	C1	5.300	-	4.067	4.25
B1	VS	C2	5.300	-	4.400	3.10
B1	VS	D1	5.300	-	3.800	5.17
B1	VS	D2	5.300	-	2.000	11.37
B2	VS	A1	4.267	-	5.367	-3.79
B2	VS	A2	4.267	-	4.500	-0.80
B2	VS	C1	4.267	-	4.067	0.69
B2	VS	C2	4.267	-	4.400	-0.46
B2	VS	D1	4.267	-	3.800	1.61
B2	VS	D2	4.267	-	2.000	7.81
A1	VS	A2	5.367	-	4.500	2.99
A1	VS	C1	5.367	-	4.067	4.48
A1	VS	C2	5.367	-	4.400	3.33
A1	VS	D1	5.367	-	3.800	5.40
A1	VS	D2	5.367	-	2.000	11.60
A2	VS	C1	4.500	-	4.067	1.49
A2	VS	C2	4.500	-	4.400	0.34
A2	VS	D1	4.500	-	3.800	2.41
A2	VS	D2	4.500	-	2.000	8.61
C1	VS	C2	4.067	-	4.400	-1.15
C1	VS	D1	4.067	-	3.800	0.92
C1	VS	D2	4.067	-	2.000	7.12
C2	VS	D1	4.400	-	3.800	2.07
C2	VS	D2	4.400	-	2.000	8.27
D1	VS	D2	3.800	-	2.000	6.20

APPENDIX E. COMPARISONS OF PERCEIVED ERRORS

Comparsions Between Levels of Perceived Errors

Critical Value of Test Statistic = 5.16 for $p < .05$

Levels of Error Subtypes			Means			Test Statistic
E1	VS	E2	2.233	-	2.000	1.27
E1	VS	B1	2.233	-	3.667	-7.80
E1	VS	B2	2.233	-	3.267	-5.62
E1	VS	A1	2.233	-	2.733	-2.72
E1	VS	A2	2.233	-	2.500	-1.45
E1	VS	C1	2.233	-	3.567	-7.26
E1	VS	C2	2.233	-	3.667	-7.80
E1	VS	D1	2.233	-	3.000	-4.17
E1	VS	D2	2.233	-	2.167	0.36
E2	VS	B1	2.000	-	3.667	-9.07
E2	VS	B2	2.000	-	3.267	-6.89
E2	VS	A1	2.000	-	2.733	-3.99
E2	VS	A2	2.000	-	2.500	-2.72
E2	VS	C1	2.000	-	3.567	-8.53
E2	VS	C2	2.000	-	3.667	-9.07
E2	VS	D1	2.000	-	3.000	-5.44
E2	VS	D2	2.000	-	2.167	-0.91
B1	VS	B2	3.667	-	3.267	2.18
B1	VS	A1	3.667	-	2.733	5.08
B1	VS	A2	3.667	-	2.500	6.35
B1	VS	C1	3.667	-	3.567	0.54
B1	VS	C2	3.667	-	3.667	0.00
B1	VS	D1	3.667	-	3.000	3.63
B1	VS	D2	3.667	-	2.167	8.16
B2	VS	A1	3.267	-	2.733	2.90
B2	VS	A2	3.267	-	2.500	4.17
B2	VS	C1	3.267	-	3.567	-1.63
B2	VS	C2	3.267	-	3.667	-2.18
B2	VS	D1	3.267	-	3.000	1.45
B2	VS	D2	3.267	-	2.167	5.99
A1	VS	A2	2.733	-	2.500	1.27
A1	VS	C1	2.733	-	3.567	-4.54
A1	VS	C2	2.733	-	3.667	-5.08
A1	VS	D1	2.733	-	3.000	-1.45
A1	VS	D2	2.733	-	2.167	3.08
A2	VS	C1	2.500	-	3.567	-5.80
A2	VS	C2	2.500	-	3.667	-6.35
A2	VS	D1	2.500	-	3.000	-2.72
A2	VS	D2	2.500	-	2.167	1.81
C1	VS	C2	3.567	-	3.667	-0.54
C1	VS	D1	3.567	-	3.000	3.08
C1	VS	D2	3.567	-	2.167	7.62
C2	VS	D1	3.667	-	3.000	3.63
C2	VS	D2	3.667	-	2.167	8.16
D1	VS	D2	3.000	-	2.167	4.54